

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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COUNTRY USSR

REPORT

SUBJECT Work on Radar Development and Guided Missiles at NII 49, Leningrad

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25 YEAR RE-REVIEW

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IV. APPENDICES

Appendix 'A'

Chemical Warfare and Biological Warfare - No information.

Appendix 'B'

Guided Missiles

- See separate sheets
attached.

Appendix 'C'

Electronics

- See separate sheets
attached.

Appendix 'D'

Naval

- No information.

Appendix 'E'

Army

- No information.

Appendix 'F'



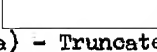
Air

- No information.

Appendix 'G'

Scientific Order of Battle - (a) Establishments - No information.
(b) Personalities - (i) German
(ii) Russian

V. ANNEXURES

Annexure 'A' - Figure 1 -  sketch of Nil 49 - LENINGRAD.
" 'B' - Figure 2 -  plan " " " "
" 'C' - Figure 3 -  sketch " Pulse Power Meter.
" 'D' - Figure 4 (a) - Truncated Paraboloid Type Radar Aerial.
Figure 4 (b) - Sketch of 2½ ton Truck carrying Radar
Aerial.

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GUIDED MISSILES

1. The following details were [] in connection with the activities of N.I.I.49 Leningrad [] which later became known as the N.S.P. or Wissenschaftliche Entwicklungs Institut des Ministerium für Schiffbauindustrie.

(a) The "Gyro" group was engaged on work in connection with the control of the Wasserfall, Rheintochter and Schmetterling type weapons. The group was not concerned with the production of these weapons, but only with reconstruction of the various electrically operated calculating machines, or dependent sub-assemblies necessary for ballistic calculations. The group was also concerned with the design and/or reconstruction of some of the varied equipment necessary for the training of personnel operating such guided missiles.

(b) [] the following equipment in the rooms allotted to the Gyro Group:-

- (i) "Grosser Rechner" - electrically operated calculating machine, used informant believes in connection with the Wasserfall weapon. (This is the PEENEMÜNDE Bodo or Einlenkrechner.
- (ii) Taurechner (Taufwinkel) - to prevent the ground operator giving "reversed" commands to the missile that would lead to course errors and possible instability of missile.
- (iii) Übungsgerät - This functioned in connection with the so-called "KNUPPEL" and enabled the operator to get experience in optical guidance.
- (iv) Luftgelagerte Kreisel (Gyroscopes with air bearings.) - Gyros seen had the following flywheel diameters: 4 cm, 6 cm and 10 cm (approximately). Frequency 500 cycles per second (30,000 r.p.m.).
- (v) A piece of equipment known as the S.G.X. [] this constituted a gyro stabilised platform for carrying control gear inside the V2.

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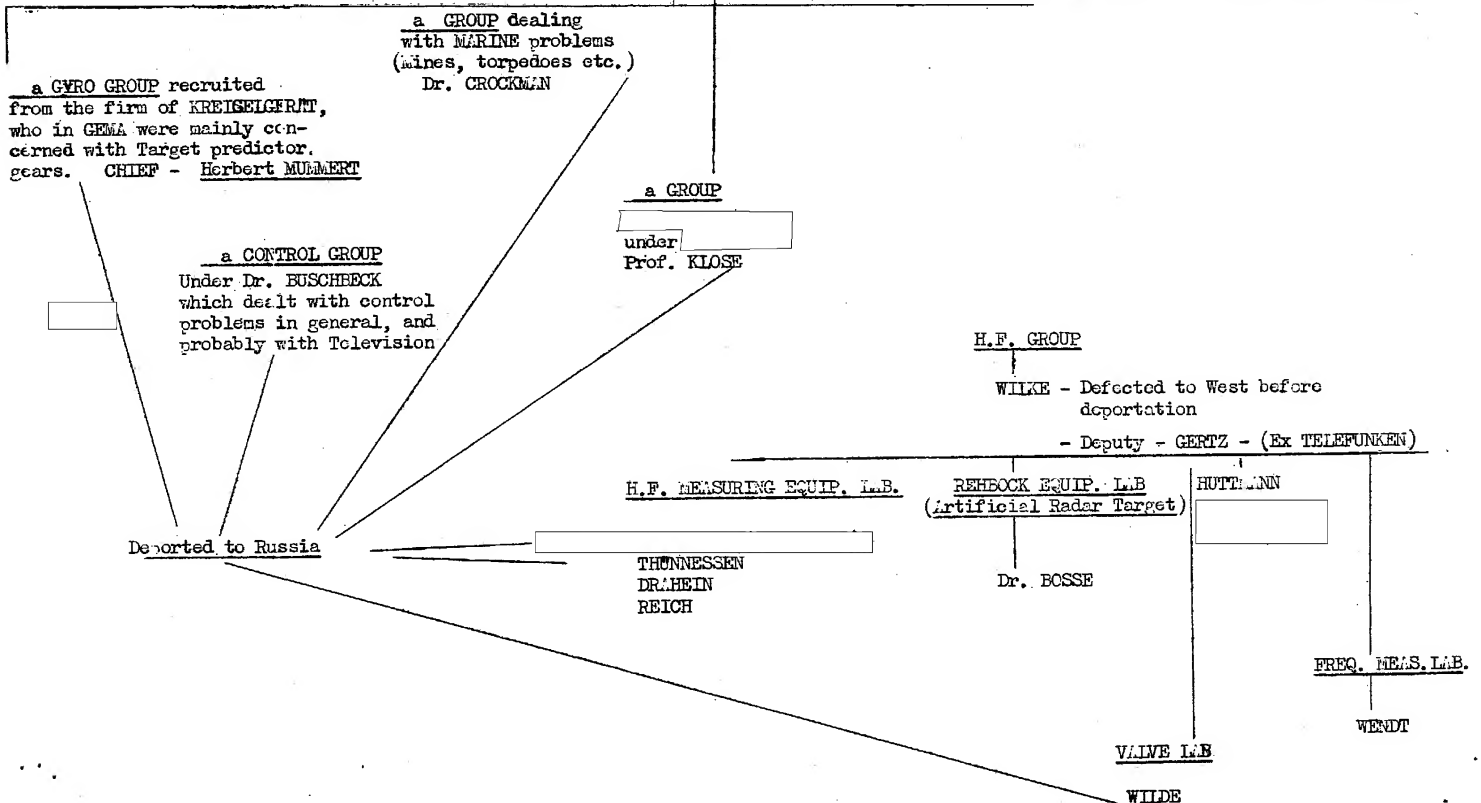
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DEPARTMENTS

AT GEMA (Under Russian Occupation)

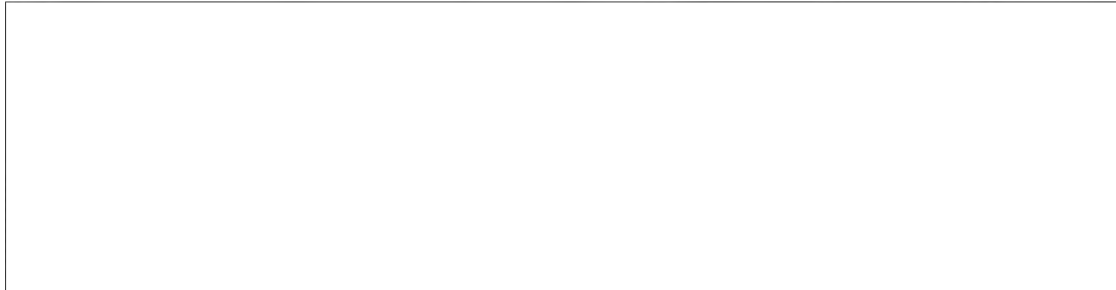
- Russian Chiefs - JEGEROV, - GRUDNITZKI (N.I.I. 400 present chief)



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8. On the 22nd October 1946 [redacted] all the GEMA personnel was deported to Russia.

9. ARRIVAL IN RUSSIA

[redacted] N.I.I. 49 situated in Hospital Strasse (Zarotov Prospect). (See Figures 1 and 2).

10. THE INSTITUTE (N.I.I. 49 - Leningrad) (Figure 1) RUSSIAN HEAD - Ing. TSCHLREN

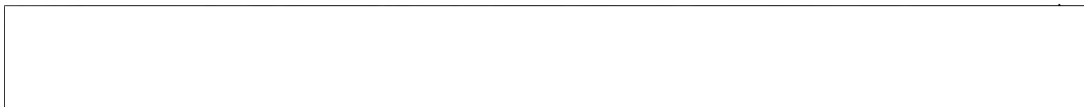
[redacted] the Institute consisted of two three-storied buildings inter-connected by an overhead (first floor) corridor. The Russian personalities were of a high technical standard [redacted] students were being trained there and [redacted] the building contained lecture rooms and laboratories. The front entrance led to the Hospital Strasse, and on the other side of the street were a number of private houses together with a repair garage. [redacted] prisoners of war were carrying out building operations on this site. By the time the Germans left, the whole of the block facing the Institute, had been transformed into a sort of factory producing radar equipment. This factory formed an organic whole with the Institute, and [redacted] the whole complex employed 2 - 3000 people, of which however not more than 1/3 were artisans.

11. The Institute (a former hospital) was known as N.I.I. 49 but during 1951, the number fell into disuse, and the institute was referred to as The Ministry For Ship-building Industry (Ministerstvo Sudostroitel'noy Promyshlennosti) or more usually as the M.S.P. [redacted]

[redacted] the KREISELGERAT and A.E.G. firms had carried out substantial orders for the Russian M.S.P. before the war. It is probable that during this period, the institute dealt mainly with ship radar and ship gyro stabilisation.)

12. [redacted] the Institute consisted of three departments as follows:-

- Department 1 - Administration and secret department (ground floor).
- Department 2 - Gyros (first floor)
- Department 3 - Radar (Top or 2nd floor)



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15. DETAILS OF INFORMANTS OWN WORK IN THE RADAR DEPARTMENT (refer also to Appendix 'C')

[redacted] the work done by the Russians was in accordance with a set plan, but [redacted] the Germans were used in a haphazard manner. [redacted] about eight Russians occupied one room in the Radar Department. Only paper work was done at first, since they practically had to start from scratch, no equipment being available.

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16. The first task [redacted] was to design a H.F. performance meter. The instrument was then manufactured by the Russians in their experimental workshops, (to which the Germans had no access) [redacted] Other work carried out during the period (November 1946 to Spring 1949) was:-

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- (a) Stabilization of 10 cm transmitter
- (b) The building of a 10 cm and 3 cm standard signal generator, [redacted]
- (c) The design of a protecting circuit for impulse overload on an amplifier ordered by SVEDLIANA.

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During the same period, THUNNESSEN had to design a heterodyne performance meter and a valve test gear.

17. THE RADAR DEPARTMENT

The Russian head of this department was Ing. SLATKIN, and [redacted] he controlled Russian technicians of high technical ability. [redacted] the department had a dual function, viz:-

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- (a) The development and test of Radar accessories
- (b) A training establishment

18. The following laboratories were contained within this department, together with lecture rooms:-

- (a) Laboratory for Amplifiers under GRIGORIEV
- (b) " " Aerials " Nina ANATOLIENJA
- (c) " " Impulse equipment under VILENKIN
- (d) " " Electronic measuring equipment under SLATKIN
- (e) An experimental workshop

The staff amounted to 50 - 60 people, not counting the workshop.

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20. THE GYRO GROUP

The group were allotted six rooms occupied as follows:-

<u>Room 1</u>	- Russian Head	- KLARITZKI	
	- German Head	- MUMMERT	
	- and interpreters		
<u>Room 2</u>	- Dr. BOGEL	- Mathematics	
	- Dr. KINDLER	- Amplifiers and main development of	} Ex GEMA
	- LAEKMAEKER	- Wasserfall equipment	
		- Circuit design	
	RUDLIN, Ing.	- ex BLEICHERODE	
	ROST	- Committed suicide	
<u>Room 3</u>	HESSLER, Ing		
	WOLTER		} Electronic development engineers
	BIELEKE		
	ENDERT		
	GOLMERT		
	BLUER, Ing		
<u>Room 4</u>	NURNBERG	- Gyro design (Taurechner designs)	
	ADLER	- Small motor designer	
	THUNNESSON	- H.F. and weak current engineer	
	ZENHOV	- Russian technician	
<u>Room 5</u>	LANGENBACH	- Chief designer - very capable	} Good designers
	ROTHER		
	BOEHM		
	BACHER		
	NIELBOCK	- Chassis designer	
<u>Room 6</u>	Frau ENDERT	- Typist	
	and Russian typists who changed frequently		

21. [redacted] the KREISELGRUPPE. [redacted] had been employed at GEMA in reconstructing the Grosser Rechner, a large calculating machine produced towards the end of the war by the firm KREISELGERAT A.G. for the flight control of Wasserfall or Rheintochter.

This calculator was not finished when the Germans were evacuated from GEMA and [redacted]

[redacted] the calculator was finished in 1948 and after some adjustments was sent away to some unknown destination early in 1949, [redacted]

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[redacted] this calculator [redacted] consisted of 8 components housed four a side in a frame structure about 2 m. high, 1.5 m. wide and 1 m. deep.

In addition to the Grosser Rechner, [redacted] the group had been busy on other target predictor gear, [redacted] the standard of the Russian engineers who were in charge of the KREISELGRUPPE as being considerably inferior to the corresponding supervisory members in the H.R. group. [redacted]

NOTE: It is clear that the Grosser Rechner is the Wasserfall Bodo or Einlenkgerät which forms the automatic (KNUPPEL) part of the Burgund Control system.

22. EQUIPMENT [redacted]

Grosser Rechner -

- (a) At least one was made and sent away by the Russians, presumably for test. The equipment was never seen again, and the German group had no knowledge of the test results.

Taurechner

[redacted] "the Taurechner automatically shifts the position of the KNUPPEL control axes, so that the proper commands are given irrespective of the orientation of the missile along its longitudinal axis (back to front position)".

Without such a device, it would be impossible to give the correct (3 dimensional) commands from a purely optical sight (2 dimensional picture).

[redacted] the original PEENE-MÜNDE Taurechner did not incorporate gyros. The KREISELGRUPPE constructed an alternative design, incorporating a "controlled gyro" (gestützter KREISEL) at the request of the Russians.

The group were apparently surprised to find that the Russian type worked equally well.

Übungsgerät

- (c) In order to train observers in the handling of the KNUPPEL, a "teacher" was designed by the Germans. This consisted of a hemisphere on which two optical images could be projected, representing the target and missile respectively. The former could be made to travel on a set course, whilst the missile spot could only follow the KNUPPEL control movements, with certain delays governed partly by the homing curve as calculated by the Einlenkgerät, as well as the aerodynamic characteristic of the rocket.

The object of the training device is to cause the operator to cause the 2 spots to coincide as quickly as possible and to maintain coincidence as long as possible.

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[redacted] The apparatus consisted of a section of a hemisphere of 3 m. radius, with an opening angle of about 45°. the observer table with ANUP-El being at the centre. [redacted] the Germans questioned the utility of the device.

- (d) Three types of gyros with air lubricated bearings; the three approximate diameters of the respective rotors were:-

4, 6 and 10 cms. Operation speed (500 cycles) 30,000 r.p.m.

- (e) an item of equipment known as the J.G.X. or S.K.X. [redacted] consists of a small box which contained a few gyros. [redacted] these constitute stabilised platforms for the automatic pilot inside the V2. [redacted]

23. DETAILS OF INFORMANT'S OWN WORK IN GYRO GROUP

After the group had returned from leave in the summer of 1950, they found that their rooms had been moved to offices in the production complex (Figure 2). They were still considered as the KREISEL group, and continued with the same tempo of work until the 5th October 1951, when the work of the group ceased, and they were left to their own devices. [redacted]

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26. ACTIVITY IN THE PRODUCTION COMPLEX

[redacted] other buildings in the complex, [redacted] many chassis and boxes of aluminium being despatched from the factory. These boxes could have been chassis and containers for electronic equipment. [redacted] identified some of the cases as amplifier housings. [redacted] some wave guides "Hohlrohr oder Wellenleiter" (about 300 units - these units were handled by Militia troops with blue caps and [redacted] were intended for the M.W.D.)

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27. The following buildings were identified there:-

Workshops
Carpenters shop
Arc welding shop
Either a spray shop or plating shop

[redacted] the complex possessed a high precision drilling machine (Lehren Bohrwerk).

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ELECTRONICS

1. [redacted] in NII.49 LENINGRAD, [redacted]
KLARITZKY [redacted] was in charge of all the Germans there. [redacted]
[redacted] in the Measuring Instrument Laboratory on the
2nd floor of the development building, [redacted] tasks [redacted]
[redacted] were as follows:-

- (i) Frequency stabilisation of a 10 cm TX which employed a lighthouse tube oscillator. [redacted] for this task a conventional discriminator circuit.
- (ii) Development of a pulse-power meter, for use at wave-lengths of 1 - 5 m (See Annexure 'C'). Also development of a simple power meter for 10 cm employing a thermister for negative pulses and a balometer for positive pulses.
- (iii) Development of a conventional standard signal generator for 10 cm.
- (iv) Development of a method for protecting R.F. amplifiers from being driven into grid current by incoming high power pulses. This method was to arrange the R-C output of a negatively driven triode, as a potential divider and so cut down the useful positive pulse output.
- (v) Development of a method for measuring the dielectric constant of solids and liquids. [redacted] Vol. 11 of the MIT series supplied the technique for this development.

[redacted]
In October 1951 all official work ceased.

3. In 1951 [redacted] saw a 2½ ton truck (Annexure 'D') with box body standing in Hospital Street, the walled-off street between the Development and Production buildings. On the roof of the truck was a radar aerial consisting of a truncated paraboloid made of medium mesh wire netting, fed by a wave-guide of rectangular cross-section. The dimension of the guide indicated the use of 10 cm. On several other occasions, usually at intervals of 3 to 6 months, [redacted] saw similar trucks standing in Hospital Street, but always without antennae. On one occasion, the back double doors were open, and [redacted] saw what appeared to be Russian-copied radar equipment on benches round the inside of the box body. Under the benches were rotary converters and generators [redacted]

[redacted] the production side of NII.49 dealt only with prototype production, [redacted] the trucks [redacted] contained experimental or prototype equipment. On the roof of the Development block, there was a radome of opaque material which [redacted] was 40 cm diameter and 50 cm high. The estimated number of personnel employed at NII.49 is from 2500 to 3000; mostly engineers and scientists.

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GENERAL

[REDACTED] KAUFMANN, KOTOWSKI, AMMON, FEUSNER in ENGELS
Prospect.

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[REDACTED] from 1945-1949 KOTOWSKI and KAUFMANN worked on LORAN
and probably built a chain.

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Since 49-50 KOTOWSKI, KAUFMANN and FEUSNER worked in the TV
Institute 380. KAUFMANN on the theory of the flip-flop circuit and
KOTOWSKI building signal generators.

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NAME	GROUP	Still There with/without Family	Returned with/only Family	QUALIFICATION
HEINZERLING	"	X		Dr. Maths
JOHN	"		X	designer
GRAEFE	"		X	
GLÖDE	"	X		
KOLL	"		X	
LAWITSCHKA	"		X	
SIMMEL	"	X		Daughter only
MACKBACH	"		X	
FROMNITZ	"		X	
MARTIN	"	X		
DILL	"		X	
DÜRING	"		X	
MYSLIWERSCHKE	"		X	
MAGERSTADT	"		X	
GRAHMÜLLER	"		X	
von LÖWIS	"		X	
SEDLER	"	X		
BOSE	"		X	
SCOTATESQNY	Blankenburg Werft	X	X	Dr.
MENSSEN	"	X	X	designer
KIEPPEL	"		X	"
SCHUHMACHER	"		X	"
KRAGE	"		X	"
TROMKE	"		X	"
WEISENBURG	"		X	"
NAD or NOTHAUS	"	X		"
DETTKE	"		X	mechanic
HOLLER	Machatschk	X		Dipl. Ing
VALERIUS	"		X	
KOTOWSKI	OSW	X	X	Dr.
Hans KOTOWSKI	"	X	X	Ing.
AMMON	"			
KAUFMANN Hans	"	X		Dr.
FEUSSNER	"	X		son only
GROSS	"	X	X	Dr.
SMEYKAL	Sestroriezk	X		Dr.
FEINTZE	"	X		
KAUFMANN	"	X		Dr.
STRAUNE	Tschemilovka/ Jena	X		
DIETRICH	"	X		
JOHN	"	X		
KRESSE	"	X		
KÜHNE	"	X		
FRIEBE	"	X		Dr.
RODE	Unknown		X	Mechanic
FISCHER	"		X	"

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DeportationSECRET

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SCIENTIFIC ORDER OF BATTLEPERSONALITIES - GERMAN

NAME	GROUP	Still There with/without Family	Returned with/only Family	QUALIFICATION
KINDLER	Mii-49		X	Dr.
BÖGEL	"		X	" Maths
VOLFF	"		X	Dr-Physicist
MURBERT	"	X		Ing.
LAENGLENER	"		X	Montage- ingenieur
MADE	"		X	Ing (Develop- ment)
MÜLLER	"		X	Dipl. Ing.
ROTHER	"		X	Ing. designer
ADLER	"		X	Ing.
EMMENT	"		X	development engineer
GOMPERT	"		X	Ing.
BÖHM	"		X	Ing.
DIELSCHE	"		X	Ing. (develop- ment)
NÜRNBERG	"		X	Ing.
LANGENBACH	"	X(son)	X	Ing.
WOLTER	"		X	Ing.
BACHER	"		X	Ing.
HESLER	"		X	Ing.
BAUR	"		X	Ing.
NIELBOCK	"		X	Ing.
THOMESSEN	"		X	Ing.
PROCHIAN	Mii-400	X	X	Dr.
SCHMIDTSON	"		X	Dr. (Maths)
Frau ANTONI	"		X	Secretary
LÜCKE	"		X	Prof. Dr.
GULSCHE	"	X		Dr.

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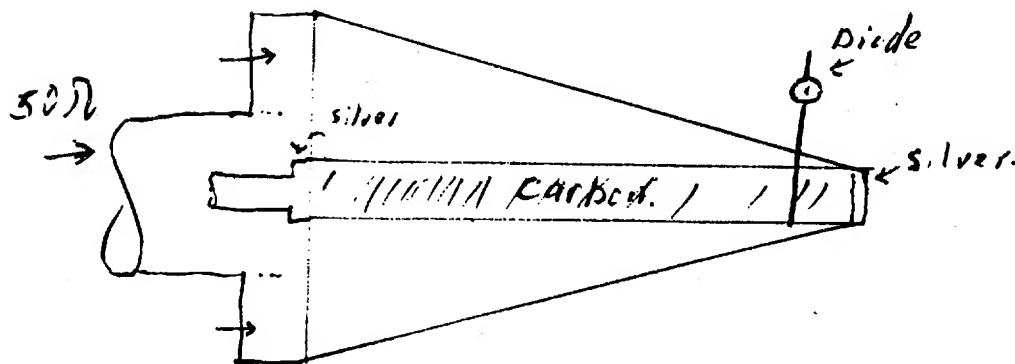
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Fig 3

Pulse power meter.



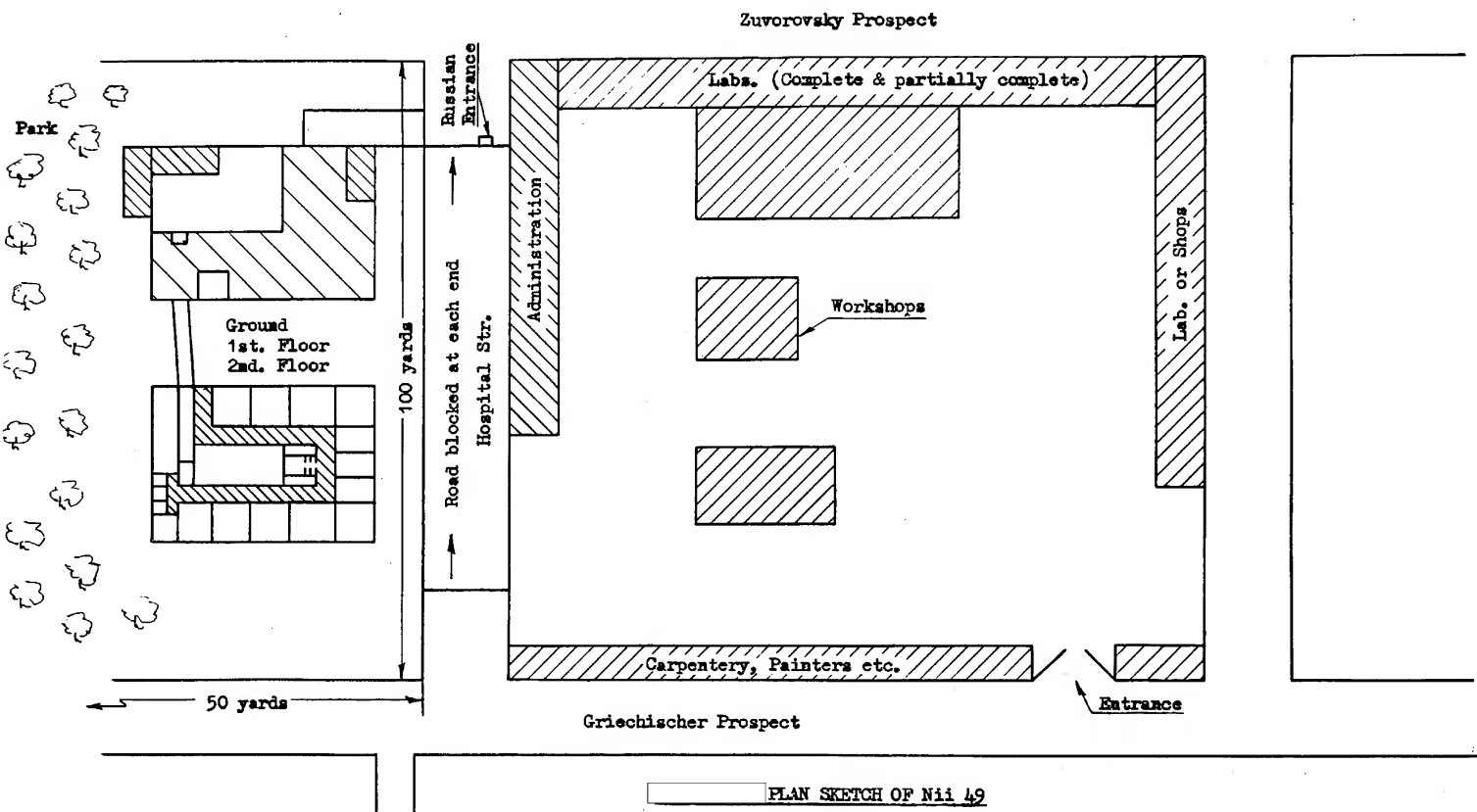
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FIGURE 2

ANNEXURE "B" to

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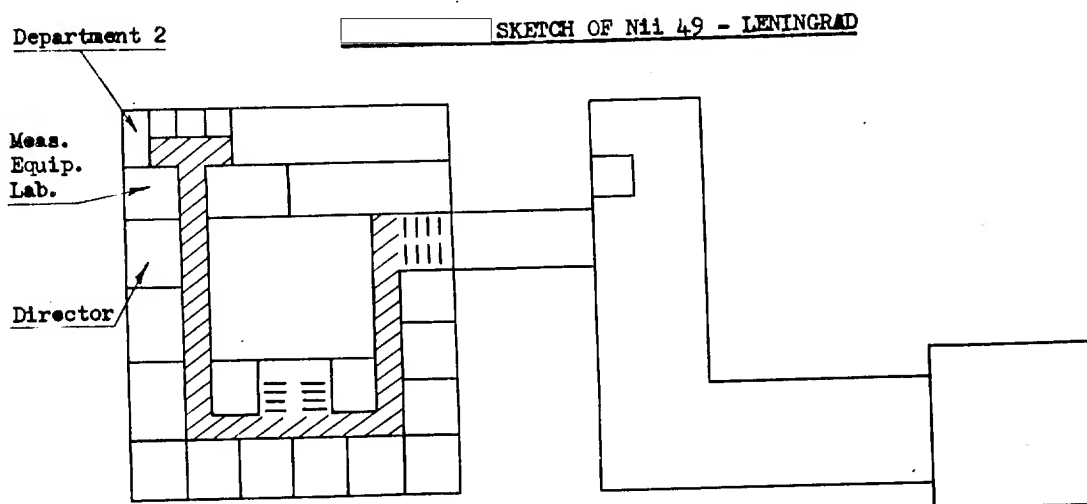


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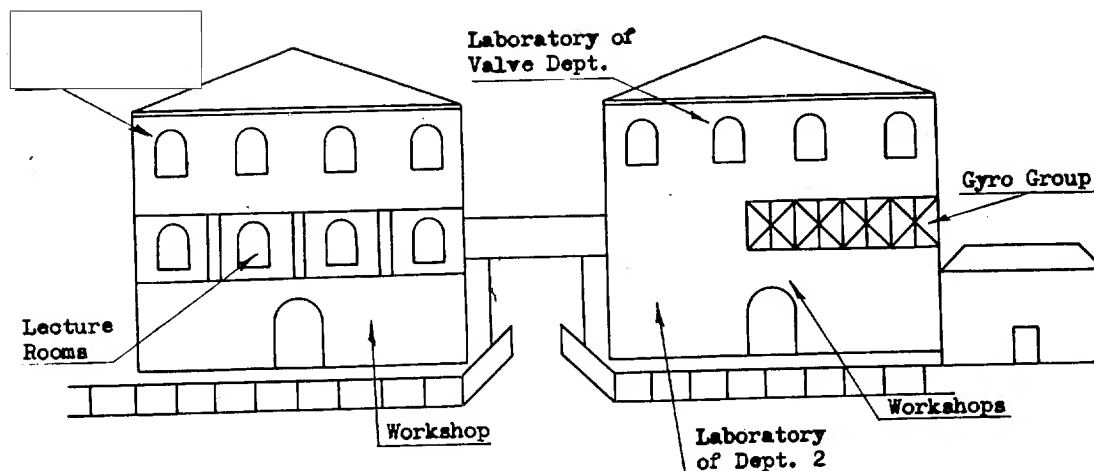
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FIGURE 1

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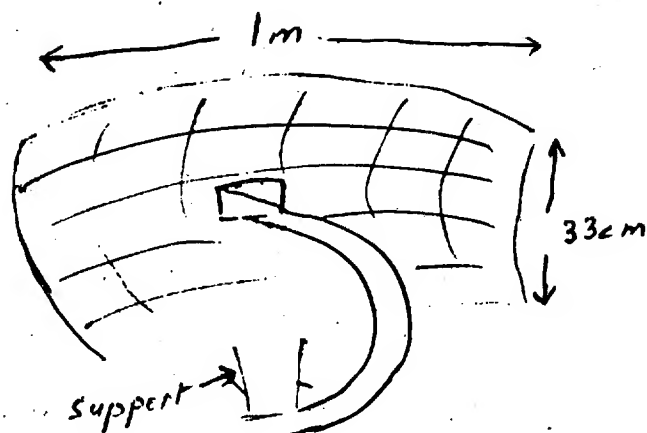
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Fig 4(a)

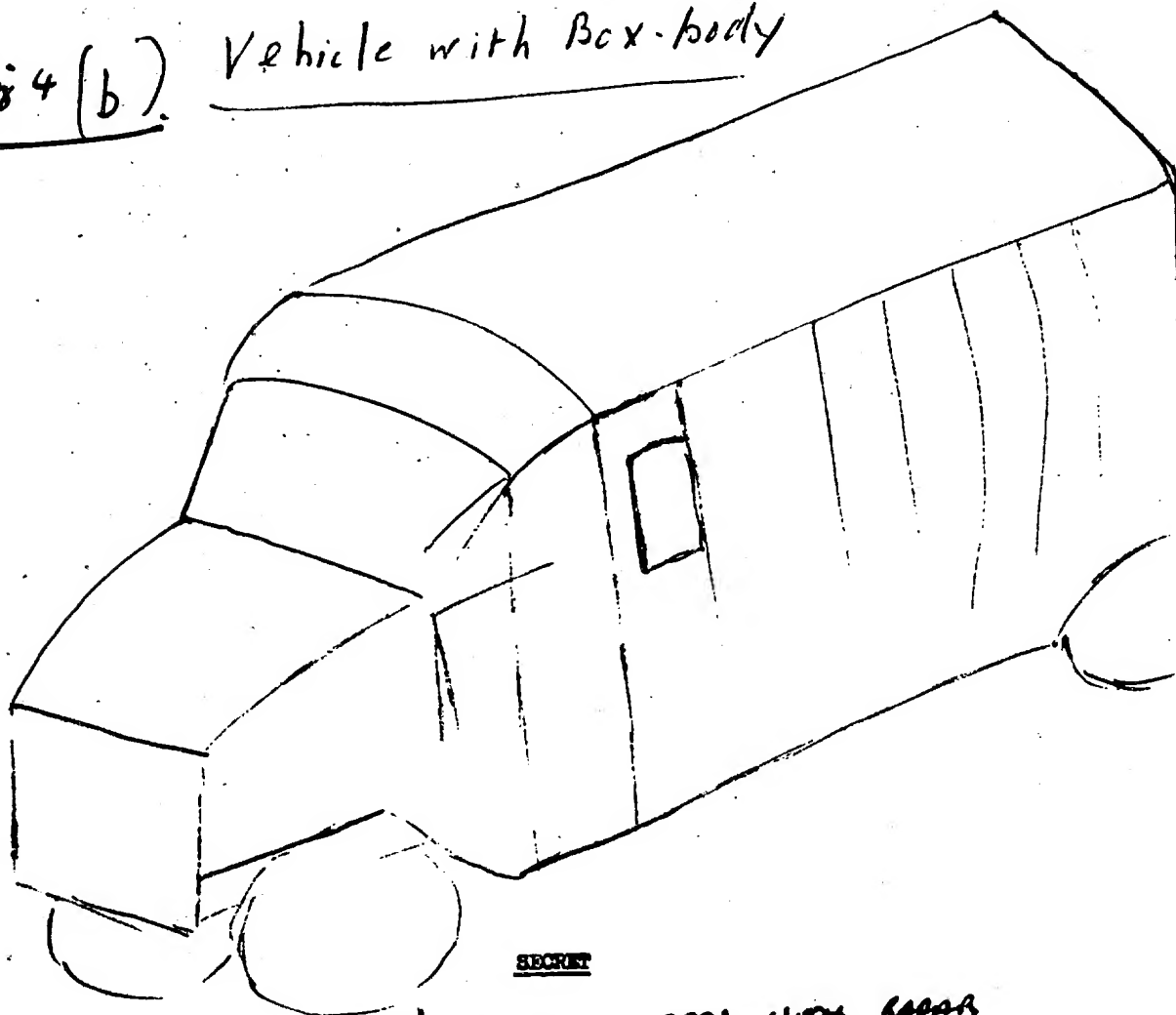
Truncated Paraboloid



SEEN ON ROOF OF TRUCK

Fig 4(b)

Vehicle with Box-body



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2 1/2 km TRUCK, SEEN WITH RADAR

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SCIENTIFIC ORDER OF BATTLE

PERSONALITIES - RUSSIAN

CHARIN	-	Head of NIL.49 Leningrad
DUBROVSKY	-	Chief engineer
SHUCHKOV	-	Personnel director - Dept. I.
ZLATKIN	-	Leader of Dept. 3.
BUISTROV	-	Head of H.F. Measuring equipment lab.
VILENKIN	-	" " Impulse " "
GRIGOROV	-	" " Amplifier and Associated equipment lab.
ANATOLEVA	-	" " Aerial lab.
FORTNOY	}	Technicians employed in Dept. 3.
SHISHAGIN		
FEINSTEIN		
YAKOVLEV		
ZAITSSEV	-	Dept. Leader - Dept. 2.
MENSHICH	-	Leader of Lab. in Dept. 2.
KLARITSKY	-	Leader of the German Gyro Group. Very bad engineer, but fairly good organizer.
FALKOV	-	Chief designer (Gyros)
Antor. STEPANOVICH	-	Librarian of Institute, elderly,

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